

Station List-Collecting Trip  
To Washington, Oregon,  
California and Baja California,  
Mexico. J. Rosewater, June 1978.

- JR-1-78      June 11, 1978 - 1:00 P.M.  
Puget Sound  
Lincoln Park  
Seattle, King County  
Washington  
  
Cobble beach between Point Williams and Brace Pt.; low  
tide, 0.8' at 1:16 P.M. - at Seattle - Vashon Id. ferry  
terminal.  
ca. 47.28 N; 122.20 W
- JR-2-78      June 12, 1978 - 8:00 A.M.  
Puget Sound  
Port Townsend  
Jefferson County  
Washington  
  
Opposite Port Townsend Motel off State Route 20;  
Cobble - boulder beach; area is at mouth of Puget  
Sound where it flows into Strait of Juan de Fuca water  
temp. 14°C, Salinity 27%.  
48.07 N; 122.46 W
- JR-3-78      June 12, 1978 - 12:30 P.M.  
Strait of Juan de Fuca  
Sekiu  
Clallam County  
Washington  
  
low tide 11:15 A.M. Water temp. 18°C, Salinity 28%.  
Littorina from rocky breakwater - on rocks and seaweed.  
48.16 N; 124.18 W
- JR-4-78      June 12, 1978 - 1:30 P.M.  
Strait of Juan de Fuca  
about 4-5 miles west of Sekiu  
Clallam County, Washington  
rising tide, rocky beach  
ca. 48.16 N; 124.19 W

JR-5-78 June 12, 1978 - 2:45 P.M.

Strait of Juan<sup>d</sup>e Fuca  
Neah Bay  
Clallam County  
Washington

rocky shore, west side of bay, Fucus; water temperature  
18°C, salinity 26%.  
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.

Mouth of Grays Harbor  
Point Chehalis  
Westport  
Grays Harbor County  
Washington

rocky revetment and groin, south entrance to Grays Harbor;  
low tide at 12:00 Noon  
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.

south side Grays Harbor, 1/4 mile west of Elk River  
Bridge on state route 105  
south of Westport  
Grays Harbor County  
Washington

Salt/Salicornia Marsh; few Alexia at bases of plants in  
mud, no littorina, water temperature 20°C, salinity 16%.  
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.

mouth of Elk River, south of bridge over state route 105  
Grays Harbor, south of Westport  
Grays Harbor County  
Washington

edge of tidal river channel; Salicornia marsh with Fucus  
at margin near channel. Littorina and eggs from on and  
under Fucus and on mud beneath. Salinity 16%.  
ca 46.48 N; 124.03 W

JR-9-78 June 13, 1978 - 4:00-4:30 P.M.

Willapa Bay, off State Route 101  
about 6 miles N.E. of Ilwaco  
Pacific County  
Washington

stony beach margin of bay Littorina and eggs associated  
with Fucus  
ca 46.19 N; 124.03 W

JR-10-78 June 14, 1978 - 9:00 A.M.

Pacific Ocean  
Cape Meares  
Tillamook County  
Oregon

outer coast, high energy beach, large cobbles; no  
Littorina seen; goose barnacles, Physalia stranded on beach.  
ca 45°.29 N; 123°.59 W.

JR-11-78 June 14, 1978 - 9:45 A.M.

Tillamook Bay (outer-west-side)  
west of Bay City and between Tillamook and Cape Meares  
Tillamook County  
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base  
of jetty and near mouth of Tillamook River  
no Littorina, Salinity 1‰  
ca 45.30 N; 123.53 W

JR-12-78 June 14, 1978 - 10:15 A.M.

Tillamook Bay - outer (west) side  
west of Bay City  
Tillamook County  
Oregon

about 1/4 mile out on jetty from stall.; rocks, boulders  
with Fucus - low salinity Littorina and eggs, few Mytilus,  
isopods, dead Mya. Salinity 0‰  
45°.30 N; 123°.53 W

JR-13-78 June 14, 1978 - 12:00 Noon

Netarts Bay  
Netarts  
Tillamook County  
Oregon

just south of City; rocky fill on shore side (inside)  
of bay. Littorina scutulata on and under rocks; water  
temperature 15°C; salinity 15‰.  
45.26 N; 123.57 W

JR-14-78 June 14, 1978 - 2:15 P.M.

Siletz Bay  
just South of Lincoln City  
Lincoln County  
Oregon

near mouth of Siletz Bay on rocky promontory just South  
of river; low tide ~~and~~ (low tide was about 1:00 P.M.)  
L. sitchana and low salinity form, L. scutulata, banded form  
from on and under rocks  
44.59 N; 123.59 W

JR-15-78 June 15, 1978 - 9:30 A.M. - 10:30 A.M.

Pacific Ocean  
Sunset Bay State Park  
South west of Charleston, ca. 2 miles  
Coos County  
Oregon

Littorina scutulata from rocks from mid-tide line to  
6-8 feet above High tide line; larger specimens higher on  
shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs  
etc. in pools; salinity 25‰ (L. sitchana and L. planaxis not  
seen although were reported by S. Behrens to have distributional  
end points here).  
ca. 43°.20; 124.18 W

JR-16-78 June 15, 1978 - 11:30-12:15 P.M.

Pacific Ocean  
South cove, Cape Arago State Park  
ca. 5 miles southwest of Charleston  
Coos County  
Oregon

Littorina scutulata from rocks, abundant stranded Physalia  
low tide ca. 12:30 P.M.  
ca. 43°.20 N, 124.18 W



- JR-17-78    June 15, 1978 - 2:30 P.M.  
Pacific Ocean at Mouth of Coquille River, north jetty  
Bandon  
Coos County  
Oregon  
  
Littorina scutulata, Thais on rocks  
43.07 N; 124.25 W
- JR-18-78    June 15, 1978  
Pacific Ocean  
1-2 miles south of Port Orford  
Curry County  
Oregon  
  
Littorina scutulata only on rocks; salinity 33%  
42.45 N; 124.30 W
- JR-19-78    June 15, 1978  
Pacific Ocean  
near Lighthouse Point, Crescent City  
Del Norte County  
California  
  
Littorina scutulata from rocks on rising tide Salinity 33%  
41.45 N; 124.12 W
- JR-20-78    June 16, 1978 - 9:15 A.M.  
Pacific Ocean  
near Lagoon Creek, ca 15 miles South of Crescent City on  
US Route 101  
Del Norte County  
California  
  
Littorina scutulata, only, on rocks  
ca. 41°.35 N; 124°.10 W
- JR-21-78    June 16, 1978 - 10:30 A.M.  
Pacific Ocean  
1 mile southwest of Orick  
Humboldt County  
California  
  
Littorina scutulata only on large rocks at south end of  
beach; on ocean side of US route 101 across road from  
freshwater lagoon.  
41.17 N; 124.04 W

JR-22-78 June 16, 1978 - 11:45 A.M.

Pacific Ocean  
Trinidad State Park, Trinidad  
Humboldt County  
California

Ocean beach; Littorina scutulata from rocks covered with seaweed.

ca. 41°10' N; 124.08 W

JR-23-78 June 16, 1978 - 12:15 P.M.

Bay side of point  
Trinidad State Park, Trinidad  
Humboldt County  
California

Littorina scutulata from rocks  
ca. 41°10' N; 124.08 W

JR-24-78 June 16, 1978 - 2:45-4:15 P.M.

West side Humboldt Bay  
about 1 mile north of Samoa  
Humboldt County, California

along Salicornia marsh fringe and mud interface;  
Littorina newcombiana, alexia some L. scutulata at base  
of plants and under Fucus - Salinity 25‰ on damp mud.  
ca. 40.47 N; 124.11 W

JR-25-78 June 17, 1978

Pacific Ocean  
about 4 miles, North at Bodega Bay on State Route 1  
Sonoma County  
California

Littorina scutulata only on rocks  
ca. 38°15' N; 123.05 W.

JR-26-78 June 17, 1978

Pacific Ocean  
about 15 miles north of Sausalito and south east of  
Bolinas, on inlet along State Route 1  
Marin County  
California

Littorina scutulata only on and under small stones and cobbles.  
ca. 37.54 N; 122.42 W

- JR-27-78     June 18, 1978                      10:30 A.M.  
West side San Francisco Bay  
along U.S. Route 101, about 1 mile North of Oyster  
Point and ca 2 miles south San Francisco city line.  
San Mateo County  
California  
  
falling tide; Littorina scutulata on and under rocks  
along water line; salinity 25%  
ca 37.41 N; 122.24 W
- JR-28-78     June 18, 1978 - 5:00 P.M.  
Mouth of San Francisco Bay  
Fort Point, at south end Golden Gate Bridge, San Francisco  
San Francisco County, California  
  
high energy beach; Littorina scutulata from rocks,  
sparse; salinity 30%  
37.48 N; 122.28 W
- JR-29-78     June 19, 1978 - 8:30 A.M.  
San Francisco Bay, under Bay Bridge  
West side Treasure Island,  
San Francisco County  
California  
  
on algae covered rocks: L. scutulata, Thais sp.; high energy  
coast; mid tide, rising; on Naval Base  
37.50 N; 122.22 W
- JR-30-78     June 19, 1978                      9:00 A.M.,  
San Francisco Bay, under Bay Bridge  
East Side Treasure Island  
San Francisco County  
California  
  
algae covered rocks (Fucus +) and under rocks; protected  
side of island; Littorina scutulata under rocks and on  
Fucus  
37.50 N; 122.22 W
- JR-31-78     June 19, 1978 - 12:00 Noon  
Monterey Bay  
rock jetty, south entrance harbor  
Moss Landing  
Monterey County  
California

Littorina planaxis, First seen here, on damp.  
boulders at top of tide line in spray zone;  
tide falling, low at 2:30 P.M.  
salinity 36 ‰  
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.

Pacific Ocean  
Asilomar State Beach  
West at Pacific Grove  
Monterey County  
California

Littorina scutulata from mid to upper tide level;  
Littorina planaxis in upper tide level to Spray zone  
above high tide line--on granitic multitextured rock--animals  
showing color and marking variations adaptive to substrate  
ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.

(1-3)

Pacific Ocean  
on rock jetty just south of Morro Rock  
Morro Bay  
San Luis Obispo County  
California

substation 1: - from beach side of jetty, mid and high tidal levels  
" 2: - from top and outside of jetty in ocean spray zone  
" 3: - from low tide line on rocks where very young, probably  
recently meta morphosed Littorina (2 species) living.  
about low tide - 35.22 N; 120.51 W

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.

Pacific Ocean  
Shell Beach, south part of town  
San Luis Obispo County  
California

Littorina scutulata and L. planaxis on rocks rising tide -  
35.09 N; 120.40 W



JR-35-78 June 21, 1978 - 10:00 A.M.

Pacific Ocean  
El Capitan Beach State Park  
ca 15 miles west of Santa Barbara  
Santa Barbara County  
California

on rocks in spray and upper intertidal zone; nearly  
high tide; Salinity 31‰  
37.43 N; 119.38 W

JR-36-78 June 21, 1978 - 12:00 Noon

Pacific Ocean  
South end of State Beach, Carpinteria  
Santa Barbara County  
California

Littorina scutulata and L. planaxis from rocky outcrop,  
falling tide  
34.24 N; 119.31 W

JR-37-78 June 22, 1978 - 12:00 Noon

Pacific Ocean  
South of State Beach, jetty at entrance to lagoon, Carlsbad,  
San Diego County  
California  
33.10 N; 117.21 W

JR-38-78 June 22, 1978 2:30 - 3:30 P.M.

Pacific Ocean  
Ocean side, tide pool area,  
Point Loma, San Diego County  
California

Littorina scutulata and L. planaxis in spray zone; some  
L. planaxis ca 30 feet above water on vertical cliff face,  
in spray zone and in pock holes in rock  
32.41 N; 117.14 W

JR-39-78 June 24, 1978 - 7:00 P.M.

Bahia De La Paz (east side)  
about 4 miles north of La Paz  
Baja California Sur  
Mexico

Route Mex 11., on shore rocks just above water Littorina  
penicillata and Nerita  
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P. M.

Bahia De La Paz (south side)  
about 8 miles west of La Paz  
El Centenario  
Baja California Sur  
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate  
shore, low tide, dead shells only, no Littorina.  
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 NOON - 1:30 P.M.

Pacific Ocean  
Punto Lobos Beach, about 2.5 miles south of Todos Santos,  
beyond <sup>end</sup> ~~each~~ of paved road Mex. 9.  
Baja California Sur  
Mexico

Littorina modesta, pullata, penicillata, and aspera in  
crevices of rocky promontory at south end of beach  
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978

Pacific Ocean  
San Pedrito, ca 4.3 miles south of Todos Santos, beyond  
end of paved road, Mex. 9.  
Baja California Sur  
Mexico

4 species of Littorinidae, as in JR-41-78, actively crawling  
in surf; rocky headland at south end of beach; nearly high  
tide-Salinity 34% in open surf; 12% in hypo saline lagoon  
behind beach  
ca 23.27 N; 110.13 W

JR-43-78 June 27, 1978

Bahia de Palmas, Gulf of California  
Los Barriles  
Baja California Sur  
Mexico

large boulders scattered on sandy beach, Littorina  
penicillata on sunny side of rocks; Siphonaria with  
spiral egg masses on wave-splashed rocks-egg masses  
about 1" across (Kodachromes taken).  
23.39 N; 109.42 W

JR-44-78 June 27, 1978 - 11:45 A.M.

Bahia San Lucas  
Cabo San Lucas  
Baja California Sur  
Mexico

on jetty near ferry landing and next to canning factory.  
4 species of Littorina on rocks and in cracks of rocks;  
L. pullata in wetter situations  
22.53 N; 109.54 W

JR-45-78 June 27, 1978 1:00 - 2:00 P.M.

Pacific Ocean, public beach between Cabo San Lucas  
and San Jose Del Cabo  
Baja California del Sur  
Mexico

4 species of Littorina on rocks  
ca 22.53 N; 109.54 W

JR-46-78 June 29, 1978 - 8:30 - 10:00 A.M.

Bahia De La Paz  
Public Beach north of Pichilingue  
about 11 miles North of La Paz  
Baja California del Sur  
Mexico

Littorina penicillata, Littorina sp., and various  
other mollusks from rocks on, under and in cracks)  
along rocky headland north of beach; many Nerita eggs.  
Few mangroves with few L. penicillata at base of trunk.  
Salinity 32-33%.  
24.15 N; 110.20 W

JR-47-78 June 29, 1978 - 11:00 A.M.

Bahia De La Paz  
about 2 miles south of Pichilingue  
Baja California Sur  
Mexico

sheltered bay with mangrove fringe;  
Littorina penicillata rare on rocks  
salinity 35%.  
ca 24.15 N; 110.20 W

JR-48-78 June 29, 1978 - 12:00 Noon

Same locality as JR-39-78  
24.10 N; 110.18 W

JR-49-78 June 29, 1978

south side Bahia De La Paz  
ferry dock, end Sinaloa St.  
La Paz  
Baja California ~~Del~~ Sur  
Mexico

Pecten Shells from fishery; Salinity 33%.  
ca 24.10 N; 110.18 W



Station List-Collecting Trip  
To Washington, Oregon,  
California and Baja California,  
Mexico. J. Rosewater, June 1978.

JR-1-78 June 11, 1978 - 1:00 P.M.

Puget Sound  
Lincoln Park  
Seattle, King County  
Washington

use "CO"

L. sitkana 796844 (A)

L. scutulata 796845 (A)

Cobble beach between Point Williams and Brace Pt.; low  
tide, 0.8' at 1:16 P.M. - at Seattle - Vashon Id. ferry  
terminal.  
ca. 47.28 N; 122.20 W

JR-2-78 June 12, 1978 - 8:00 A.M.

Puget Sound  
Port Townsend  
Jefferson County  
Washington

L. scutulata 796846 (A)

L. sitkana 796847 (A)

Opposite Port Townsend Motel off State Route 20;  
Cobble - boulder beach; area is at mouth of Puget  
Sound where it flows into Strait of Juan de Fuca water  
temp. 14°C, Salinity 27%.  
48.07 N; 122.46 W

JR-3-78 June 12, 1978 - 12:30 P.M.

Strait of Juan de Fuca  
Sekiu  
Clallam County  
Washington

L. sitkana 796848 (A)

L. scutulata 796849 (A)

low tide 11:15 A.M. Water temp. 18°C, Salinity 28%.  
Littorina from rocky breakwater - on rocks and seaweed.  
48.16 N; 124.18 W

JR-4-78 June 12, 1978 - 1:30 P.M.

Strait of Juan de Fuca  
about 4-5 miles west of Sekiu  
Clallam County, Washington  
rising tide, rocky beach  
ca. 48.16 N; 124.19 W

L. scutulata 796850 (A)

L. sitkana 796851 (A)

JR-5-78 June 12, 1978 - 2:45 P.M.

Strait of Juan de Fuca  
Neah Bay  
Clallam County  
Washington

*L. sitkana* 794216 (A, D)  
*L. scutulata* 794217 (A)

rocky shore, west side of bay, Fucus; water temperature  
18°C, salinity 26%.  
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.

Mouth of Grays Harbor  
Point Chehalis  
Westport  
Grays Harbor County  
Washington

*L. scutulata* 794218 (A)

rocky revetment and groin, south entrance to Grays Harbor;  
low tide at 12:00 Noon  
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.

south side Grays Harbor, 1/4 mile west of Elk River  
Bridge on state route 105  
south of Westport  
Grays Harbor County  
Washington

Salt/Salicornia Marsh; few Alexia at bases of plants in  
mud, no Littorina, water temperature 20 C, salinity 16%.  
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.

mouth of Elk River, south of bridge over state route 105  
\* Grays Harbor, south of Westport  
Grays Harbor County  
Washington

*L. newcombiana-sitkana* 794219 (A)

edge of tidal river channel; Salicornia marsh with Fucus  
at margin near channel. Littorina and eggs from on and  
under Fucus and on mud beneath. Salinity 16%.  
ca 46.48 N; 124.03 W

JR-9-78 June 13, 1978 - 4:00-4:30 P.M.

Willapa Bay, off State Route 101  
about 6 miles N.E. of Ilwaco  
Pacific County  
Washington

h. "newcombiana" [S. + Kana] (A)  
794220

stony beach margin of bay Littorina and eggs associated  
with Fucus  
ca 46.19 N; 124.03 W

JR-10-78 June 14, 1978 - 9:00 A.M.

Pacific Ocean  
Cape Meares  
Tillamook County  
Oregon

outer coast, high energy beach, large cobbles; no  
Littorina seen; goose barnacles, Physalia stranded on beach.  
ca 45°.29 N; 123°.59 W.

JR-11-78 June 14, 1978 - 9:45 A.M.

Tillamook Bay (outer-west-side)  
west of Bay City and between Tillamook and Cape Meares  
Tillamook County  
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base  
of jetty and near mouth of Tillamook River  
no Littorina, Salinity 1‰.  
ca 45.30 N; 123.53 W

JR-12-78 June 14, 1978 - 10:15 A.M.

Tillamook Bay - outer (west) side  
west of Bay City  
Tillamook County  
Oregon

h. s.itchana

about 1/4 mile out on jetty from stall.; rocks, boulders  
with Fucus - low salinity Littorina and eggs, few Mytilus,  
isopods, dead Mya. Salinity 0‰.  
45°.30 N; 123°.53 W



✓ JR-13-78 June 14, 1978 - 12:00 Noon

Netarts Bay  
Netarts  
Tillamook County  
Oregon

*L. scutulata* 794222 (A)

just south of City; rocky fill on shore side (inside)  
of bay. Littorina scutulata on and under rocks; water  
temperature 15°C; salinity 15‰  
45.26 N; 123.57 W

✓ JR-14-78 June 14, 1978 - 2:15 P.M.

Siletz Bay  
just South of Lincoln City  
Lincoln County  
Oregon

*L. s. sitchana* 794223 (A)  
*L. scutulata* 794224 (A)

near mouth of Siletz Bay on rocky promontory just South  
of river; low tide ~~and~~ (low tide was about 1:00 P.M.)  
L. sitchana and low salinity form, L. scutulata, banded form  
from on and under rocks  
44.59 N; 123.59 W

✓ JR-15-78 June 15, 1978 - 9:30 A.M. - 10:30 A.M.

Pacific Ocean  
Sunset Bay State Park  
South west of Charleston, ca. 2 miles  
Coos County  
Oregon

*L. scutulata* 794225 (A)

Littorina scutulata from rocks from mid-tide line to  
6-8 feet above High tide line; larger specimens higher on  
shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs  
etc. in pools; salinity 25‰ (L. sitchana and L. planaxis not  
seen although were reported by S. Behrens to have distributional  
end points here).  
ca. 43°.20; 124.18 W

✓ JR-16-78 June 15, 1978 - 11:30-12:15 P.M.

Pacific Ocean  
South cove, Cape Arago State Park  
ca. 5 miles southwest of Charleston  
Coos County  
Oregon

*L. scutulata* 794226 (A)

Littorina scutulata from rocks, abundant stranded Physalia  
low tide ca. 12:30 P.M.  
ca. 43°.20 N, 124.18 W



JR-17-78 June 15, 1978 - 2:30 P.M.

Pacific Ocean at Mouth of Coquille River, north jetty  
Bandon  
Coos County  
Oregon

*L. scutulata* 794227 (A)

Littorina scutulata, Thais on rocks  
43.07 N; 124.25 W

JR-18-78 June 15, 1978

Pacific Ocean  
1-2 miles south of Port Orford  
Curry County  
Oregon

*L. scutulata* 794228 (A)

Littorina scutulata only on rocks; salinity 33%  
42.45 N; 124.30 W

JR-19-78 June 15, 1978

Pacific Ocean  
near Lighthouse Point, Crescent City  
Del Norte County  
California

*L. scutulata* 794229 (A)

Littorina scutulata from rocks on rising tide Salinity 33%  
41.45 N; 124.12 W

JR-20-78 June 16, 1978 - 9:15 A.M.

Pacific Ocean  
near Lagoon Creek, ca 15 miles South of Crescent City on  
US Route 101  
Del Norte County  
California

*L. scutulata* 794230

Littorina scutulata, only, on rocks  
ca. 41.35 N; 124.10 W

JR-21-78 June 16, 1978 - 10:30 A.M.

Pacific Ocean  
1 mile southwest of Orick  
Humboldt County  
California

*L. scutulata* 794231

Littorina scutulata only on large rocks at south end of  
beach; on ocean side of US route 101 across road from  
freshwater lagoon.  
41.17 N; 124.04 W

JR-22-78 June 16, 1978 - 11:45 A.M.

Pacific Ocean  
Trinidad State Park, Trinidad  
Humboldt County  
California

*L. scutulata* 794232 (A)

Ocean beach; Littorina scutulata from rocks covered with seaweed.  
ca. 41°10 N; 124.08 W

JR-23-78 June 16, 1978 - 12:15 P.M.

Bay side of point  
Trinidad State Park, Trinidad  
Humboldt County  
California

*L. scutulata* 794233 (A)

Littorina scutulata from rocks  
ca. 41°10 N; 124.08 W

JR-24-78 June 16, 1978 - 2:45-4:15 P.M.

West side Humboldt Bay  
about 1 mile north of Samoa  
Humboldt County, California

*L. newcombiana* 79425 (A)  
*L. scutulata* (D)  
766363

along Salicornia marsh fringe and mud interface;  
Littorina newcombiana, alexia some L. scutulata at base  
of plants and under Fucus; - Salinity 25‰ on damp mud.  
ca. 40.47 N; 124.11 W

JR-25-78 June 17, 1978

Pacific Ocean  
about 4 miles, North of Bodega Bay on State Route 1  
Sonoma County  
California

*L. scutulata* 794252 (A)

Littorina scutulata only on rocks  
ca. 38°15 N; 123.05 W.

JR-26-78 June 17, 1978

Pacific Ocean  
about 15 miles north of Sausalito and south east of  
Bolinas, on inlet along State Route 1  
Marin County  
California

*L. scutulata* 794253 (A)

Littorina scutulata only on and under small stones and cobbles.  
ca. 37.54 N; 122.42 W

- α JR-27-78 June 18, 1978 10:30 A.M.  
West side San Francisco Bay  
along U.S. Route 101, about 1 mile North of Oyster  
Point and ca 2 miles south San Francisco city line.  
San Mateo County  
California *L. scutulata* 794254 (H)
- falling tide; Littorina scutulata on and under rocks  
along water line; salinity 25‰  
ca 37.41 N; 122.24 W
- 2 JR-28-78 June 18, 1978 - 5:00 P.M.  
Mouth of San Francisco Bay  
Fort Point, at south end Golden Gate Bridge, San Francisco  
San Francisco County, California *L. scutulata* 794255 (H)
- high energy beach; Littorina scutulata from rocks,  
sparse; salinity 30‰  
37.48 N; 122.28 W
- 3 JR-29-78 June 19, 1978 - 8:30 A.M.  
San Francisco Bay, under Bay Bridge  
West side Treasure Island,  
San Francisco County  
California *L. scutulata* 794256 (H)
- on algae covered rocks: L. scutulata, Thais sp.; high energy  
coast; mid tide, rising; on Naval Base  
37.50 N; 122.22 W
- α JR-30-78 June 19, 1978 9:00 A.M.  
San Francisco Bay, under Bay Bridge  
East Side Treasure Island  
San Francisco County  
California *L. scutulata* 794257 (H)
- algae covered rocks (Fucus +) and under rocks; protected  
side of island; Littorina scutulata under rocks and on  
Fucus  
37.50 N; 122.22 W
- α α JR-31-78 June 19, 1978 - 12:00 Noon  
Monterey Bay  
rock jetty, south entrance harbor  
Moss Landing  
Monterey County  
California *L. scutulata* 794258 (H) 2  
*L. keenae* 794259 (H) 3  
(over)



Littorina planaxis, First seen here, on damp.  
boulders at top of tide line in spray zone;  
tide falling, low at 2:30 P.M.  
salinity 36 ‰  
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.

Pacific Ocean  
Asilomar State Beach  
West at Pacific Grove  
Monterey County  
California

*L. scutulata* (A) 794260  
*L. keenae* (A) 794359

Littorina scutulata from mid to upper tide level;  
Littorina planaxis in upper tide level to Spray zone  
above high tide line--on granitic multitextured rock--animals  
showing color and marking variations adaptive to substrate  
ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.  
(1-3)

Pacific Ocean  
on rock jetty just south of Morro Rock  
Morro Bay  
San Luis Obispo County  
California

*L. keenae* (sub-1) 794261 (A)  
*L. scutulata* (sub-1) 794262 (A)  
*L. keenae* (sub-2) 794263 (A) } SR-SS  
sub  
1-3

substation 1: - from beach side of jetty, mid and high tidal levels  
" 2: - from top and outside of jetty in ocean spray zone  
" 3: - from low tide line on rocks where very young, probably  
recently metamorphosed Littorina (2 species) living.  
about low tide - 35.22 N; 120.51 W

*L. scutulata* (sub-3) 794264 (A)  
*L. keenae* (sub-3) 794265 (A)  
*L. scutulata* (sub-3) 794266 (A)

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.

Pacific Ocean of  
Shell Beach, south (part of town)  
San Luis Obispo County  
California

*L. scutulata* 794267 (A)  
*L. keenae* 794268 (A)

Littorina scutulata and L. planaxis on rocks rising tide -  
35.09 N; 120.40 W



JR-35-78 June 21, 1978 - 10:00 A.M.

Pacific Ocean  
El Capitan Beach State Park  
ca 15 miles west of Santa Barbara  
Santa Barbara County  
California

*L. scutulata* (A) 794269  
*L. keenae* (A) 794270

on rocks in spray and upper intertidal zone; nearly  
high tide; Salinity 31%.  
37.43 N; 119.38 W

JR-36-78 June 21, 1978 - 12:00 Noon

Pacific Ocean  
South end of State Beach, Carpinteria  
Santa Barbara County  
California

*L. scutulata* (A) 194211  
*L. keenae* (A) 794212

Littorina scutulata and L. planaxis from rocky outcrop,  
falling tide  
34.24 N; 119.31 W

JR-37-78 June 22, 1978 - 12:00 Noon

Pacific Ocean  
South of State Beach, jetty at entrance to lagoon, Carlsbad,  
San Diego County  
California  
33.10 N; 117.21 W

*L. keenae* (A) 794273  
*L. scutulata* (A) 794274

JR-38-78 June 22, 1978 2:30 - 3:30 P.M.

Pacific Ocean  
Ocean side, tide pool area,  
Point Loma, San Diego County  
California

*L. scutulata* (A) 794279  
*L. keenae* (A) 794280

Littorina scutulata and L. planaxis in spray zone; some  
L. planaxis ca 30 feet above water on vertical cliff face,  
in spray zone and in pock holes in rock  
32.41 N; 117.14 W

JR-39-78 June 24, 1978 - 7:00 P.M.

Bahia De La Paz (east side)  
about 4 miles north of La Paz  
Baja California Sur  
Mexico

*L. penicillata* (A) 794300

Route Mex 11., on shore rocks just above water Littorina  
penicillata and Nerita  
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P. M.

Bahia De La Paz (south side)  
about 8 miles west of La Paz  
El Centenario  
Baja California Sur  
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate  
shore, low tide, dead shells only, no Littorina.  
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 Noon - 1:30 P.M.

Pacific Ocean  
Punto Lobos Beach, about 2.5 miles south of Todos Santos,  
beyond <sup>end</sup> ~~each~~ of paved road Mex. 9.  
Baja California Sur  
Mexico

*L. modesta* (A) 794301

*L. aspera* (A) 794302

*L. penicillata* (A) 794303

*L. pullata* (A) 794304

SR  
41

Littorina modesta, pullata, penicillata, and aspera in  
crevices of rocky promontory at south end of beach  
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978

Pacific Ocean  
San Pedrito, ca 4.3 miles south of Todos Santos, beyond  
end of paved road, Mex. 9.  
Baja California Sur  
Mexico

*L. aspera* (A) 794304

*L. penicillata* (A) 794305

*L. modesta* (A) 794306

*L. pullata* (A) 794307

SR-42

4 species of Littorinidae, as in JR-41-78, actively crawling  
in surf; rocky headland at south end of beach; nearly high  
tide-Salinity 34% in open surf; 12% in hypo saline lagoon  
behind beach  
ca 23.27 N; 110.13 W

JR-43-78 June 27, 1978

Bahia de Palmas, Gulf of California  
Los Barriles  
Baja California Sur  
Mexico

*L. penicillata* (A) 794308

large boulders scattered on sandy beach, *Littorina penicillata* on sunny side of rocks; *Siphonaria* with spiral egg masses on wave-splashed rocks-egg masses about 1" across (Kodachromes taken).  
23.39 N; 109.42 W

JR-44-78 June 27, 1978 - 11:45 A.M.

Bahia San Lucas  
Cabo San Lucas  
Baja California Sur  
Mexico

*L. pullata* (A) 796341  
*L. aspera* (A) 796304  
*L. atrata* (A) 794310  
*L. modesta* (A) 794311  
*L. penicillata* (A) 794312

on jetty near ferry landing and next to canning factory.  
4 species of *Littorina* on rocks and in cracks of rocks;  
*L. pullata* in wetter situations  
22.53 N; 109.54 W

JR-45-78 June 27, 1978 1:00-2:00 P.M.

Pacific Ocean, public beach between Cabo San Lucas and San Jose Del Cabo  
Baja California del Sur  
Mexico

*L. modesta* (A) 796843

break here  
"over" &  
put next

4 species of *Littorina* on rocks  
ca 22.53 N; 109.54 W

*L. pullata* (A) 794313  
*L. penicillata* (A) 794314

JR-46-78 June 29, 1978 - 8:30 - 10:00 A.M.

Bahia De La Paz  
Public Beach north of Pichilingue  
about 11 miles North of La Paz  
Baja California del Sur  
Mexico

*L. penicillata* (A) 794388  
*L. albicarinata* (A) 794389

*Littorina penicillata*, *Littorina* sp., and various other mollusks from rocks on, under and in cracks) along rocky headland north of beach; many *Nerita* eggs. Few mangroves with few *L. penicillata* at base of trunk.  
Salinity 32-33%.  
24.15 N; 110.20 W



JR-47-78 June 29, 1978 - 11:00 A.M.

*L. penicillata* (H) 794390

Bahia De La Paz  
about 2 miles south of Pichilingue  
Baja California Sur  
Mexico

sheltered bay with mangrove fringe;  
Littorina penicillata rare on rocks  
salinity 35‰  
ca 24.15 N; 110.20 W

JR-48-78 June 29, 1978 - 12:00 Noon

*L. albicincta* (H) 794391  
*L. penicillata* (H) 794392

Same locality as JR-39-78  
24.10 N; 110.18 W

JR-49-78 June 29, 1978

south side Bahia De La Paz  
ferry dock, end Sinaloa St.  
La Paz  
Baja California Sur  
Mexico

Pecten Shells from fishery; Salinity 33‰  
ca 24.10 N; 110.18 W



Station List-Collecting Trip  
To Washington, Oregon,  
California and Baja California,  
Mexico. J. Rosewater, June 1978.

JR-1-78 June 11, 1978 - 1:00 P.M.

Puget Sound  
Lincoln Park  
Seattle, King County  
Washington

Cobble beach between Point Williams and Brace Pt.; low  
tide, 0.8' at 1:16 P.M. - at Seattle - Vashon Id. ferry  
terminal.  
ca. 47.28 N; 122.20 W

JR-2-78 June 12, 1978 - 8:00 A.M.

Puget Sound  
Port Townsend  
Jefferson County  
Washington

Opposite Port Townsend Motel off State Route 20;  
Cobble - boulder beach; area is at mouth of Puget  
Sound where it flows into Strait of Juan de Fuca water  
temp. 14°C, Salinity 27%.  
48.07 N; 122.46 W

JR-3-78 June 12, 1978 - 12:30 P.M.

Strait of Juan de Fuca  
Sekiu  
Clallam County  
Washington

low tide 11:15 A.M. Water temp. 18°C, Salinity 28‰  
Littorina from rocky breakwater - on rocks and seaweed.  
48.16 N; 124.18 W

JR-4-78 June 12, 1978 - 1:30 P.M.

Strait of Juan de Fuca  
about 4-5 miles west of Sekiu  
Clallam County, Washington  
rising tide, rocky beach  
ca. 48.16 N; 124.19 W

JR-5-78 June 12, 1978 - 2:45 P.M.

Strait of Juan<sup>d</sup>e Fuca  
Neah Bay  
Clallam County  
Washington

rocky shore, west side of bay, Fucus; water temperature  
18°C, salinity 26‰  
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.

Mouth of Grays Harbor  
Point Chehalis  
Westport  
Grays Harbor County  
Washington

rocky revetment and groin, south entrance to Grays Harbor;  
low tide at 12:00 Noon  
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.

south side Grays Harbor, 1/4 mile west of Elk River  
Bridge on state route 105  
south of Westport  
Grays Harbor County  
Washington

Salt/Salicornia Marsh; few Alexia at bases of plants in  
mud, no Littorina, water temperature 20°C, salinity 16‰  
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.

mouth of Elk River, south of bridge over state route 105  
Grays Harbor, south of Westport  
Grays Harbor County  
Washington

edge of tidal river channel; Salicornia marsh with Fucus  
at margin near channel. Littorina and eggs from on and  
under Fucus and on mud beneath. Salinity 16‰  
ca 46.48 N; 124.03 W

JR-9-78 June 13, 1978 - 4:00-4:30 P.M.

Willapa Bay, off State Route 101  
about 6 miles N.E. of Ilwaco  
Pacific County  
Washington

stony beach margin of bay Littorina and eggs associated  
with Fucus  
ca 46.19 N; 124.03 W

JR-10-78 June 14, 1978 - 9:00 A.M.

Pacific Ocean  
Cape Meares  
Tillamook County  
Oregon

outer coast, high energy beach, large cobbles; no  
Littorina seen; goose barnacles, Physalia stranded on beach.  
ca 45°.29 N; 123°.59 W.

JR-11-78 June 14, 1978 - 9:45 A.M.

Tillamook Bay (outer-west-side)  
west of Bay City and between Tillamook and Cape Meares  
Tillamook County  
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base  
of jetty and near mouth of Tillamook River  
no Littorina, Salinity 1‰  
ca 45.30 N; 123.53 W

JR-12-78 June 14, 1978 - 10:15 A.M.

Tillamook Bay - outer (west) side  
west of Bay City  
Tillamook County  
Oregon

about 1/4 mile out on jetty from stall.; rocks, boulders  
with Fucus - low salinity Littorina and eggs, few Mytilus,  
isopods, dead Mya. Salinity 0‰  
45°.30 N; 123°.53 W



JR-13-78 June 14, 1978 - 12:00 Noon

Netarts Bay  
Netarts  
Tillamook County  
Oregon

just south of City; rocky fill on shore side (inside)  
of bay. Littorina scutulata on and under rocks; water  
temperature 15°C; salinity 15‰.  
45.26 N; 123.57 W

JR-14-78 June 14, 1978 - 2:15 P.M.

Siletz Bay  
just South of Lincoln City  
Lincoln County  
Oregon

near mouth of Siletz Bay on rocky promontory just South  
of river; low tide ~~and~~ (low tide was about 1:00 P.M.)  
L. sitchana and low salinity form, L. scutulata, banded form  
from on and under rocks  
44.59 N; 123.59 W

JR-15-78 June 15, 1978 - 9:30 A.M. - 10:30 A.M.

Pacific Ocean  
Sunset Bay State Park  
South west of Charleston, ca. 2 miles  
Coos County  
Oregon

Littorina scutulata from rocks from mid-tide line to  
6-8 feet above High tide line; larger specimens higher on  
shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs  
etc. in pools; salinity 25‰ (L. sitchana and L. planaxis not  
seen although were reported by S. Behrens to have distributional  
end points here).  
ca. 43°.20; 124.18 W

JR-16-78 June 15, 1978 - 11:30-12:15 P.M.

Pacific Ocean  
South cove, Cape Arago State Park  
ca. 5 miles southwest of Charleston  
Coos County  
Oregon

Littorina scutulata from rocks, abundant stranded Physalia  
low tide ca. 12:30 P.M.  
ca. 43°.20 N, 124.18 W



JR-17-78 June 15, 1978 - 2:30 P.M.

Pacific Ocean at Mouth of Coquille River, north jetty  
Bandon  
Coos County  
Oregon

Littorina scutulata, Thais on rocks  
43.07 N; 124.25 W

JR-18-78 June 15, 1978

Pacific Ocean  
1-2 miles south of Port Orford  
Curry County  
Oregon

Littorina scutulata only on rocks; salinity 33%  
42.45 N; 124.30 W

JR-19-78 June 15, 1978

Pacific Ocean  
near Lighthouse Point, Crescent City  
Del Norte County  
California

Littorina scutulata from rocks on rising tide Salinity 33%  
41.45 N; 124.12 W

JR-20-78 June 16, 1978 - 9:15 A.M.

Pacific Ocean  
near Lagoon Creek, ca 15 miles South of Crescent City on  
US Route 101  
Del Norte County  
California

Littorina scutulata, only, on rocks  
ca. 41°.35 N; 124°.10 W

JR-21-78 June 16, 1978 - 10:30 A.M.

Pacific Ocean  
1 mile southwest of Orick  
Humboldt County  
California

Littorina scutulata only on large rocks at south end of  
beach; on ocean side of US route 101 across road from  
freshwater lagoon.  
41.17 N; 124.04 W

JR-22-78 June 16, 1978 - 11:45 A.M.

Pacific Ocean  
Trinidad State Park, Trinidad  
Humboldt County  
California

Ocean beach; Littorina scutulata from rocks covered with seaweed.

ca. 41°10 N; 124.08 W

JR-23-78 June 16, 1978 - 12:15 P.M.

Bay side of point  
Trinidad State Park, Trinidad  
Humboldt County  
California

Littorina scutulata from rocks

ca. 41°10 N; 124.08 W

JR-24-78 June 16, 1978 - 2:45-4:15 P.M.

West side Humboldt Bay  
about 1 mile north of Samoa  
Humboldt County, California

along Salicornia marsh fringe and mud interface;  
Littorina newcombiana, alexia some L. scutulata at base  
of plants and under Fucus,- Salinity 25‰ on damp mud.  
ca. 40.47 N; 124.11 W

JR-25-78 June 17, 1978

Pacific Ocean  
about 4 miles, North at Bodega Bay on State Route 1  
Sonoma County  
California

Littorina scutulata only on rocks

ca. 38°15 N; 123.05 W.

JR-26-78 June 17, 1978

Pacific Ocean  
about 15 miles north of Sausalito and south east of  
Bolinas, on inlet along State Route 1  
Marin County  
California

Littorina scutulata only on and under small stones and cobbles.

ca. 37.54 N; 122.42 W

JR-27-78 June 18, 1978 10:30 A.M.

West side San Francisco Bay  
along U.S. Route 101, about 1 mile North of Oyster  
Point and ca 2 miles south San Francisco city line.  
San Mateo County  
California

falling tide; Littorina scutulata on and under rocks  
along water line; salinity 25%  
ca 37.41 N; 122.24 W

JR-28-78 June 18, 1978 - 5:00 P.M.

Mouth of San Francisco Bay  
Fort Point, at south end Golden Gate Bridge, San Francisco  
San Francisco County, California

high energy beach; Littorina scutulata from rocks,  
sparse; salinity 30%  
37.48 N; 122.28 W

JR-29-78 June 19, 1978 - 8:30 A.M.

San Francisco Bay, under Bay Bridge  
West side Treasure Island,  
San Francisco County  
California

on algae covered rocks: L. scutulata, Thais sp.; high energy  
coast; mid tide, rising; on Naval Base  
37.50 N; 122.22 W

JR-30-78 June 19, 1978 9:00 A.M.

San Francisco Bay, under Bay Bridge  
East Side Treasure Island  
San Francisco County  
California

algae covered rocks (Fucus +) and under rocks; protected  
side of island; Littorina scutulata under rocks and on  
Fucus  
37.50 N; 122.22 W

JR-31-78 June 19, 1978 - 12:00 Noon

Monterey Bay  
rock jetty, south entrance harbor  
Moss Landing  
Monterey County  
California



Littorina planaxis, First seen here, on damp.  
boulders at top of tide line in spray zone;  
tide falling, low at 2:30 P.M.  
salinity 36 ‰  
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.

Pacific Ocean  
Asilomar State Beach  
West at Pacific Grove  
Monterey County  
California

Littorina scutulata from mid to upper tide level;  
Littorina planaxis in upper tide level to Spray zone  
above high tide line—on granitic multitextured rock—animals  
showing color and marking variations adaptive to substrate  
ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.  
(1-3)

Pacific Ocean  
on rock jetty just south of Morro Rock  
Morro Bay  
San Luis Obispo County  
California

substation 1: - from beach side of jetty, mid and high tidal levels  
" 2: - from top and outside of jetty in ocean spray zone  
" 3: - from low tide line on rocks where very young, probably  
recently meta morphosed Littorina (2 species) living.  
about low tide - 35.22 N; 120.51 W

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.

Pacific Ocean  
Shell Beach, south part of town  
San Luis Obispo County  
California

Littorina scutulata and L. planaxis on rocks rising tide -  
35.09 N; 120.40 W

JR-35-78 June 21, 1978 - 10:00 A.M.

Pacific Ocean  
El Capitan Beach State Park  
ca 15 miles west of Santa Barbara  
Santa Barbara County  
California

on rocks in spray and upper intertidal zone; nearly  
high tide; Salinity 31‰  
37.43 N; 119.38 W

JR-36-78 June 21, 1978 - 12:00 Noon

Pacific Ocean  
South end of State Beach, Carpinteria  
Santa Barbara County  
California

Littorina scutulata and L. planaxis from rocky outcrop,  
falling tide  
34.24 N; 119.31 W

JR-37-78 June 22, 1978 - 12:00 Noon

Pacific Ocean  
South of State Beach, jetty at entrance to lagoon, Carlsbad,  
San Diego County  
California  
33.10 N; 117.21 W

JR-38-78 June 22, 1978 2:30 - 3:30 P.M.

Pacific Ocean  
Ocean side, tide pool area,  
Point Loma, San Diego County  
California

Littorina scutulata and L. planaxis in spray zone; some  
L. planaxis ca 30 feet above water on vertical cliff face,  
in spray zone and in pock holes in rock  
32.41 N; 117.14 W

JR-39-78 June 24, 1978 - 7:00 P.M.

Bahia De La Paz (east side)  
about 4 miles north of La Paz  
Baja California Sur  
Mexico

Route Mex 11., on shore rocks just above water Littorina  
penicillata and Nerita  
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P. M.

Bahia De La Paz (south side)  
about 8 miles west of La Paz  
El Centenario  
Baja California Sur  
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate  
shore, low tide, dead shells only, no Littorina.  
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 NOON - 1:30 P.M.

Pacific Ocean  
Punto Lobos Beach, about 2.5 miles south of Todos Santos,  
beyond <sup>end</sup> ~~each~~ of paved road Mex. 9.  
Baja California Sur  
Mexico

Littorina modesta, pullata, penicillata, and aspera in  
crevices of rocky promontory at south end of beach  
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978

Pacific Ocean  
San Pedrito, ca 4.3 miles south of Todos Santos, beyond  
end of paved road, Mex. 9.  
Baja California Sur  
Mexico

4 species of Littorinidae, as in JR-41-78, actively crawling  
in surf; rocky headland at south end of beach; nearly high  
tide-Salinity 34% in open surf; 12% in hypo saline lagoon  
behind beach  
ca 23.27 N; 110.13 W



JR-43-78 June 27, 1978

Bahia de Palmas, Gulf of California  
Los Barriles  
Baja California Sur  
Mexico

large boulders scattered on sandy beach, Littorina  
penicillata on sunny side of rocks; Siphonaria with  
spiral egg masses on wave-splashed rocks-egg masses  
about 1" across (Kodachromes taken).  
23.39 N; 109.42 W

JR-44-78 June 27, 1978 - 11:45 A.M.

Bahia San Lucas  
Cabo San Lucas  
Baja California Sur  
Mexico

on jetty near ferry landing and next to canning factory.  
4 species of Littorina on rocks and in cracks of rocks;  
L. pullata in wetter situations  
22.53 N; 109.54 W

JR-45-78 June 27, 1978 1:00-2:00 P.M.

Pacific Ocean, public beach between Cabo San Lucas  
and San Jose Del Cabo  
Baja California del Sur  
Mexico

4 species of Littorina on rocks  
ca 22.53 N; 109.54 W

JR-46-78 June 29, 1978 - 8:30 - 10:00 A.M.

Bahia De La Paz  
Public Beach north of Pichilingue  
about 11 miles North of La Paz  
Baja California del Sur  
Mexico

Littorina penicillata, Littorina sp., and various  
other mollusks from rocks on, under and in cracks)  
along rocky headland north of beach; many Nerita eggs.  
Few mangroves with few L. penicillata at base of trunk.  
Salinity 32-33%.  
24.15 N; 110.20 W

JR-47-78 June 29, 1978 - 11:00 A.M.

Bahia De La Paz  
about 2 miles south of Pichilingue  
Baja California Sur  
Mexico

sheltered bay with mangrove fringe;  
Littorina penicillata rare on rocks  
salinity 35‰  
ca 24.15 N; 110.20 W

JR-48-78 June 29, 1978 - 12:00 Noon

Same locality as JR-39-78  
24.10 N; 110.18 W

JR-49-78 June 29, 1978

south side Bahia De La Paz  
ferry dock, end Sinaloa St.  
La Paz  
Baja California ~~Del~~ Sur  
Mexico

Pecten Shells from fishery; Salinity 33‰  
ca 24.10 N; 110.18 W



Station List - Collecting Trip  
TO Washington, Oregon,  
California and Baja California,  
Mexico. J. Rosewater, June 1978.

JR-1-78 June 11, 1978 - 1:00 P.M.

Lincoln Park, Puget Sound

King County

Seattle, Washington

cobble beach between Point Williams +  
Brace Pt.; low tide, off at 1:16 P.M. -  
at Seattle - Vashon Id. ferry terminal.  
ca. 47.28 N, 122.20 W

JR-2-78

June 12, 1978 - 8:00 AM

Puget Sound

Port Townsend

Jefferson County

Washington

opposite Port Townsend Motel, off State Route  
20. cobble - boulder beach, area is at mouth  
of Puget Sound where it flows into Strait of  
Juan de Fuca. water Temp. 14°C, Salinity  
27‰

48.07 N, 122.46 W

JR-3-78

June 12, 1978 - 12:30 P.M.

Strait of Juan de Fuca

SeKiwa

Clallam County

Washington

low tide 11:15 A.M.

Temp & water 18°C,  
Salinity 28‰, Littorin from rocky  
breakwater - on rocks and seaweed.

48.16 N, 124.18 W

JR-4-78

June 12, 1978 - 1:30 P.M.

Strait of Juan de Fuca

about 4-5 miles west of SeKiwa

Clallam County Washington

~~low~~ <sup>rising</sup> tide, rocky beach

ca. 48.16 N, 124.19 W



JR-5-78 June 12, 1978 - 4:45 PM.

Strait of Juan de Fuca  
Neah Bay  
Clallam County

WASHINGTON <sup>west side of bay</sup>

✓ rocky shore <sup>^</sup> Fucus, water temperature 18°C  
salinity 26‰, 48.22N; 124.37W.

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June 13, 1978 10:30 AM.

JR-6-78 / Mouth of Grays Harbor

Point Chehalis  
Westport

GRAYS HARBOR County

Washington

✓ rocky revetment & groin south entrance  
to Grays Harbor, low tide at 12:00 Noon  
ca 46.53N; 124.06W

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JR-7-78 June 13, 1978 12:00 Noon - 12:30 PM.

~~EIK River~~, south side Grays Harbor,  
1/4 mile west of EIK River Bridge on state route 105  
south of Westport  
Grays Harbor County  
Washington

✓ Salt/Salicornia Marsh, few Alexia at bases  
of plants in mud, no Littorina, water  
temperature 20°C, salinity 16‰  
ca 46.48N; 124.03W

JR-8-78

June 13, 1978

12:30 PM - 1:30 PM

mouth of Elk River, south of bridge over  
state route 105

Grays Harbor, south of Westport

Grays Harbor County

Washington

edge of tidal river channel; Salicornia  
marsh with Fucus at margin near channel.  
Littorina + eggs from on + under Fucus  
mud beneath. salinity 16‰

✓ ca 46.48 N, 124.03 W

JR-9-78

June 13, 1978

4:00 - 4:30 PM.

Willapa Bay, off State Route 101  
about 6 miles NE of Ilwaco

Pacific County

Washington

✓ strong beach margin of bay Littorina  
+ eggs associated with Fucus

ca 46.19 N, 124.03 W

~~list next station first~~JR-~~11~~-78

June 14, 1978

9:45 AM.

Tillamook Bay (outer - west-side)

west of Bay City + between Tillamook and  
Cape Mearns

Tillamook County

OREGON

rocks, muddy shore with Fucus patches  
+ Salicornia, at base of jetty +  
near mouth of Tillamook River.  
no Littorina; salinity 1‰

ca 45.30 N; 123.53 W



↓  
JR-10-78

June 14, 1978

9:00 A.M.

Pacific Ocean  
Cape Meares  
Tillamook County  
OREGON

outer coast, high energy beach, large  
cobbles; no Littorina seen; goose  
barnacles, Physalia stranded on  
beach.

✓ ~~ca 45.29 N~~ ca 45.29 N; 123.59 W.

JR-12-78

June 14, 1978

10:15 AM

Tillamook Bay - outer (west) side  
west of Bay City  
Tillamook County  
Oregon

about 1/4 mile out on jetty from  
sta. 11, rocks, boulders with Fucus -  
low salinity Littorina and eggs, few  
Mytilus, isopods, dead Mya. Salinity 0‰  
45.30 N; 123.53 W.

JR-13-78

June 14, 1978

12:00 Noon

Netarts Bay  
Netarts

Tillamook County  
OREGON

✓ just south of city; rocky fill on  
shore side (inside) of bay. Littorina  
scutulata on + under rocks; water  
temperature 15°C; salinity 15‰.  
45.26 N; 123.57 W.



JR-14-78

June 14, 1978

2:15 P.M.

Siletz Bay

just South of Lincoln City

Lincoln County

OREGON

near mouth of Siletz Bay on rocky promontory just south of river low tide + (low tide was about 1:00 PM) *L. sitchana* + low salinity form, *L. scutellata*, banded form on and under rocks

✓ 44.59 N, 123.59 W.

JR-15-78

June 15, 1978

9:30 A.M. - 10:30 A.M.

Pacific Ocean

Sunset Bay State Park

South west of Charleston, ca. 2 miles

Coos County

Oregon

*Littorina scutellata* from rocks from mid-tide line to 6-8 feet above High tide Line, larger specimens higher on shore; *Fucus* + *Ulva*; *Tegula* "murex", Anemones, crabs etc in pools; salinity 25‰ (*L. sitchana* + *L. planaxis* not seen although were reported by J. Behrens to have distributional end points here).

✓ ca 43°20', 124°18' W

JR-16-78

June 15, 1978

11:30 - 12:15 P.M.

Pacific Ocean

✓ south cove Cape Arago State Park

ca. 5 miles southwest of Charleston

Coos County

Oregon

ca 43°20' N, 124°18' W

*Littorina scutellata* from rocks, abundant stranded *Rhyssalia*  
low tide ca. 12:30 P.M.

JR-17-78

June 15, 1978 2:30 P.M.  
 Pacific Ocean at  
 mouth of Coquille River, north jetty  
 Bandon  
 Coos County  
 Oregon

Littorina scutulata, Thais on rocks

✓ 43.07 N, 124.25 W

JR-18-78

June 15, 1978

Pacific Ocean

1-2 miles south of Port Orford

CURRY County

Oregon

Littorina scutulata only on rocks; salinity 33‰

✓ 42.45 N, 124.30 W

JR-19-78

June 15, 1978

Pacific Ocean

near Lighthouse Point, Crescent City

Del Norte County

California

Littorina scutulata from rocks on rising  
 tide Salinity 33‰

✓ 41.45 N, 124.12 W

JR-20-78

June 16, 1978

9:15 A.M.

Pacific Ocean

near Lagoon Creek, ca 15 miles South of

Crescent City on US <sup>Route</sup> 101.

Del Norte County

California

✓ Littorina scutulata, only, on rocks

ca 41°35' N, 124°10' W



JR-21-78 June 16, 1978 10:30 AM

Pacific Ocean  
1 mile southwest of Orick  
Humboldt County  
California

Littorina scutulata only on large rocks  
at south end of beach, on ocean side  
of US route 101 across road from freshwater  
lagoon.

✓ 41.17N, 124.04 W.

JR-22-78 June 16, 1978 11:45 AM.

Pacific Ocean  
Trinidad State Park, Trinidad  
Humboldt County  
California

Ocean beach, Littorina scutulata from  
rocks covered with seaweed.

✓ ca 41°10'N, 124.08 W

JR-23-78 June 16, 1978 12:15 P.M.

Bay side of point  
Trinidad State Park, Trinidad  
Humboldt County  
California

Littorina scutulata from rocks.

ca 41°10'N, 124.08 W

JR-24-78 June 16, 1978 2:45-4:15 PM

✓ west side Humboldt Bay  
about 1 mile north of Samoa  
Humboldt County, California

ca 40.47N,  
124.11 W

along Salicornia marsh fringe + mud intertace,  
Littorina newcombiana, alexia some L. scutulata at  
base of plants and under Fucus - Salinity 25-30  
on damp mud.



JR-25-78

June 17, 1978

Pacific Ocean

about 4 miles North of Bodega Bay  
on state Route 1.

Sonoma County

California

✓ Littorina scutulata only on rocks  
ca 38° 15' N, 123° 05' W.

JR-26-78

June 17, 1978

Pacific Ocean

about 15 miles north of Sausalito  
& southeast of Bolinas, on inlet along State Route 1  
Marin County

California

✓ Littorina scutulata only on and under  
small stones and cobbles.

✓ ↑ ca 37.54° N, 122.42° W

JR-27-78

June 18, 1978

10:30 AM

west side San Francisco Bay

along U.S. Route 101, about 1 mile North of Oyster

Point &amp; ca 2 miles South San Francisco city line.

San Mateo County

California

✓ falling tide, Littorina scutulata on and under  
rocks along water line; salinity 25‰

↑ ca 37.41° N, 122.28° W

JR-28-78

June 18, 1978

5:00 P.M.

mouth of San Francisco Bay

✓ Fort Point, at south end Golden Gate  
Bridge, San Francisco,

San Francisco County, California

high energy beach, Littorina scutulata from  
rocks, sparse; salinity 30‰  
37.48° N, 122.28° W

JR-29-78

June 19, 1978 8:30 AM.

San Francisco Bay, under Bay Bridge  
 West Side Treasure Island,  
 San Francisco County  
California

✓ on algae covered rocks: *L. scutulata*,  
*Thais* sp.; high energy coast, mid tide,  
 rising; on Naval Base.

37.50 N; 122.22 W

JR-30-78

June 19, 1978 9:00 A.M.

San Francisco Bay, under Bay Bridge  
 East Side Treasure Island  
 San Francisco County  
California

algae covered rocks (Fucus +) and under  
 rocks, protected side of island; *Littorina*  
*scutulata* under rocks and on Fucus.

✓ 37.50 N; 122.22 W

JR-31-78

June 19, 1978 12:00 Noon

Monterey Bay  
 rock jetty, south entrance harbor  
 Moss Landing  
 Monterey County  
California

✓ *Littorina planaxis*, First seen here, on damp.  
 boulders at top of tide line in spray  
 zone; tide falling, low at 2:30 P.M.  
 salinity 36 ‰

36.48 N; 121.47 W.



JR-32-78 June 19, 1978 4:00 P.M.  
Pacific Ocean  
Asilomar State Beach  
west of Pacific Grove  
Monterey County  
✓ California

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Littorina scutulata from mid to upper tide level,  
Littorina planaxis in upper tide level to  
spray zone above high tide line — on  
granitic multitextured rock — animals  
showing color and marking variations adaptive  
to substrate.

✓ ca 36.38 N, 121.56 W

JR-33-78(1-3) June 20, 1978 1:00 P.M.  
Pacific Ocean  
on rock jetty just south of Morro Rock  
Morro Bay  
✓ San Luis Obispo County  
California

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- Substation 1: — from beach side of jetty, mid + high tidal levels  
" 2: — from top and outside of jetty in ocean  
spray zone  
" 3: — from low tide line on rocks where very  
young, probably recently metamorphosed  
✓ Littorina (2 species) living.  
about low tide — 35.22 N, 120.51 W
- 

JR-34-78 June 20, 1978 4:00 - 5:00 P.M.  
Pacific Ocean  
✓ Shell Beach, south part of town  
San Luis Obispo County, California

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Littorina scutulata and L. planaxis on rocks  
rising tide — 35.09 N, 120.40 W



JR-35-78

June 21, 1978

10:00 AM.

Pacific Ocean

El Capitan Beach State Park

ca 15 miles west of Santa Barbara

Santa Barbara County

California 37.43 N, 119.38 W.

✓ on rocks in spray + upper intertidal zone; nearly high tide; salinity 31.700

JR-36-78

June 21, 1978

12:00 NOON

Pacific Ocean.

South end of State Beach, Carpinteria

Santa Barbara County

California

Littorina scutulata + L. planaxis from rocky outcrop, falling tide.

✓ 34.24 N; 119.31 W

JR-37-78

June 22, 1978

12:00 NOON

Pacific Ocean

South of State Beach, jetty at entrance to lagoon, Carlsbad,

San Diego County

✓ California 33.10 N, 117.21 W

JR-38-78

June 22, 1978

2:30 - 3:30 P.M.

Pacific Ocean

ocean side, tide pool area,

✓ Point Loma, San Diego County

California 32.41 N, 117.14 W.

Littorina scutulata and L. planaxis in spray zone; some L. planaxis ca 30 feet above water on vertical cliff face, in spray zone and in rock holes in rock.



JR-3<sup>9</sup><sub>1</sub>-78

June 24, 1978 7:00 P.M.  
Bahia De La Paz (east side)  
about 4 miles north of La Paz  
Baja California Sur  
Mexico

Route Mex 11., on shore rocks just above  
water Littorina penicillata and Nerita  
24.10 N; 110.18 W.

JR-40-78

June 25, 1978 5:30 P.M.  
Bahia De La Paz (south side)  
about 8 miles west of La Paz  
EL Centenario  
Baja California Sur  
Mexico

Route Mex. 1, west of La Paz; pebble and  
sand conglomerate shore, low tide; dead  
shells only, no Littorina.  
ca 24.10 N; 110.18 W

JR-41-78

June 26, 1978 12:00 Noon - 1:30 P.M.  
Pacific Ocean  
Punta Lobos Beach, about 2.5 miles  
south of Todos Santos, beyond end  
of paved road Mex. 9.  
Baja California Sur  
Mexico

Littorina modesta, pullata, penicillata,  
and aspera in crevices of rocks above  
tide line; rocky promontory at south  
end of beach.

ca 23.27 N; 110.13 W.

JR-42-78

June 26, 1978.

Pacific Ocean

San Pedrito, ca 4.3 miles south  
of Todos Santos, beyond end of  
paved road, Mex 9.

Baja California Sur  
Mexico

4 species of Littorinidae, as in JR-41-78,  
actively crawling in surf; rocky headland  
at south end of beach; nearly high tide  
Salinity 34 ‰ in open surf; 12 ‰ in  
✓ hyposaline lagoon behind beach.  
ca 23.27 N, 110.13 W.

JR-43-78

June 27, 1978

Bahia de Palmas, Gulf of California

Los Barriles

Baja California Sur  
Mexico

large boulders scattered on sandy beach,  
Littorina penicillata on sunny side of  
rocks; Siphonaria with spiral egg  
masses on wave-splashed rocks - egg  
masses about 1" across (Kodachromes  
taken).

✓ 23.39 N, 109.42 W

JR-44-78

June 27, 1978

11:45 A.M.

Bahia San Lucas

Cabo San Lucas

✓ Baja California Sur, Mexico

on jetty near ferry landing and next to  
canning factory. 4 species of Littorina on  
rocks and in cracks of rocks. L. pullata in wetter  
situations. 22.53 N, 109.54 W



JR-45-78      June 27, 1978      1:00 - 2:00 PM.  
Pacific Ocean, public beach  
between Cabo San Lucas and  
San Jose Del Cabo  
Baja California del Sur  
Mexico

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✓ 4 species of Littorina on rocks  
ca 22.53N, 109.54W.

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JR-46-78      June 29, 1978      8:30 - 10:00 AM.  
Bahia De La Paz (PI)-  
Public Beach north of Pichilingue  
about 11 miles North of La Paz  
Baja California del Sur  
Mexico

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Littorina penicillata, Littorina sp., and various  
other mollusks from rocks on, under and in  
cracks) along rocky headland north of beach;  
many Nerita eggs. Few mangroves with few  
L. penicillata at base of trunk. Salinity 32-33‰

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✓ 24.15N; 110.20W

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JR-47-78      June 29, 1978      11:00 AM.  
Bahia De La Paz  
about 2 miles south of Pichilingue  
Baja California Sur  
Mexico

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sheltered bay with mangrove fringe;  
Littorina penicillata rare on rocks;

✓ salinity 35‰

ca 24.15N; 110.20W

JR-48-78 June 29, 1978 12:00 Noon  
Same locality as JR-39-78  
24.10N, 110.18W.

✓  
JR-49-78 June 29, 1978  
south side Bahía De La Paz  
ferry dock, end Sinaloa St.  
La Paz  
Bahia California Del Sur  
Mexico

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Pecten shells from fishing; salinity 33‰  
ca. 24.10N, 110.18W